

**CETECOM™**

**CETECOM ICT Services**  
consulting - testing - certification >>>

## TEST REPORT

Test report no.: 1-9521/15-01-07-A



Deutsche  
Akkreditierungsstelle  
D-PL-12076-01-00

### Testing laboratory

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**Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-00

### Applicant

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### Manufacturer

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### Test standard/s

47 CFR Part 27

Title 47 of the Code of Federal Regulations; Chapter I; Part 27 - Miscellaneous wireless communications services

RSS - 139 Issue 2

Spectrum Management and Telecommunications Radio Standards Specification - Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz  
Spectrum Management and Telecommunications Radio Standards Specification - Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:** LTE SMT module

**Model name:** PLS8-V

**FCC ID:** QIPPLS8-V

**IC:** 7830A-PLS8V

**Frequency:** LTE Band 4;13

**Technology tested:** LTE

**Antenna:** External antenna

**Power supply:** 3.8 V DC by external power supply

**Temperature range:** -30°C to +60°C



This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### Test report authorised:

Andreas Luckenbill  
Lab Manager  
Radio Communications & EMC

### Test performed:

p.o.  
Tobias Wittenmeier  
Testing Manager  
Radio Communications & EMC

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

**This test report replaces the test report with the number 1-9521/15-01-07 and dated 2015-06-26**

### 2.2 Application details

Date of receipt of order:	2015-03-12
Date of receipt of test item:	2015-03-16
Start of test:	2015-03-17
End of test:	2015-07-31
Person(s) present during the test:	-/-

### 3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 27	-/-	Title 47 of the Code of Federal Regulations; Chapter I; Part 27 - Miscellaneous wireless communications services
RSS - 130 Issue 1	01.10.2013	Mobile Broadband Services (MBS) Equipment Operating in the Frequency Bands 698-756 MHz and 777-787 MHz
RSS - 139 Issue 2	01.02.2009	Spectrum Management and Telecommunications Radio Standards Specification - Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz

#### 3.1 Measurement guidance

Guidance	Version	Description
ANSI C63.4-2014	-/-	American national standard for methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

#### 4 Test environment

Temperature:	$T_{nom}$	+22 °C during room temperature tests
	$T_{max}$	+60 °C during high temperature tests
	$T_{min}$	-30 °C during low temperature tests
Relative humidity content:		55 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	3.8 V DC by external power supply
	$V_{max}$	4.2 V
	$V_{min}$	3.3 V

#### 5 Test item

Kind of test item	:	LTE SMT module
Type identification	:	PLS8-V
FCC ID:		QIPPLS8-V
IC:		7830A-PLS8V
PMN	:	Cinterion PLS8-V
HVIN	:	PLS8-V
FVIN	:	-/-
HMN	:	-/-
S/N serial number	:	No information available
HW hardware status	:	Rev. 2.3
SW software status	:	Rev. 03.000
Frequency band [MHz]	:	LTE Band 4;13
Type of radio transmission	:	OFDM
Use of frequency spectrum	:	
Type of modulation	:	QPSK, 16 – QAM
Antenna	:	External antenna
Power supply	:	3.8 V DC by external power supply
Temperature range	:	-30°C to +60°C

#### 5.1 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup- and EUT-photos are included in test report: 1-9521/15-01-08\_AnnexA  
1-9521/15-01-08\_AnnexC

Reference Document: Test Report No. 1-9521\_15-01-04-A

#### 6 Test laboratories sub-contracted

None

## 7 Description of the test setup, test equipment and ancillaries used for tests

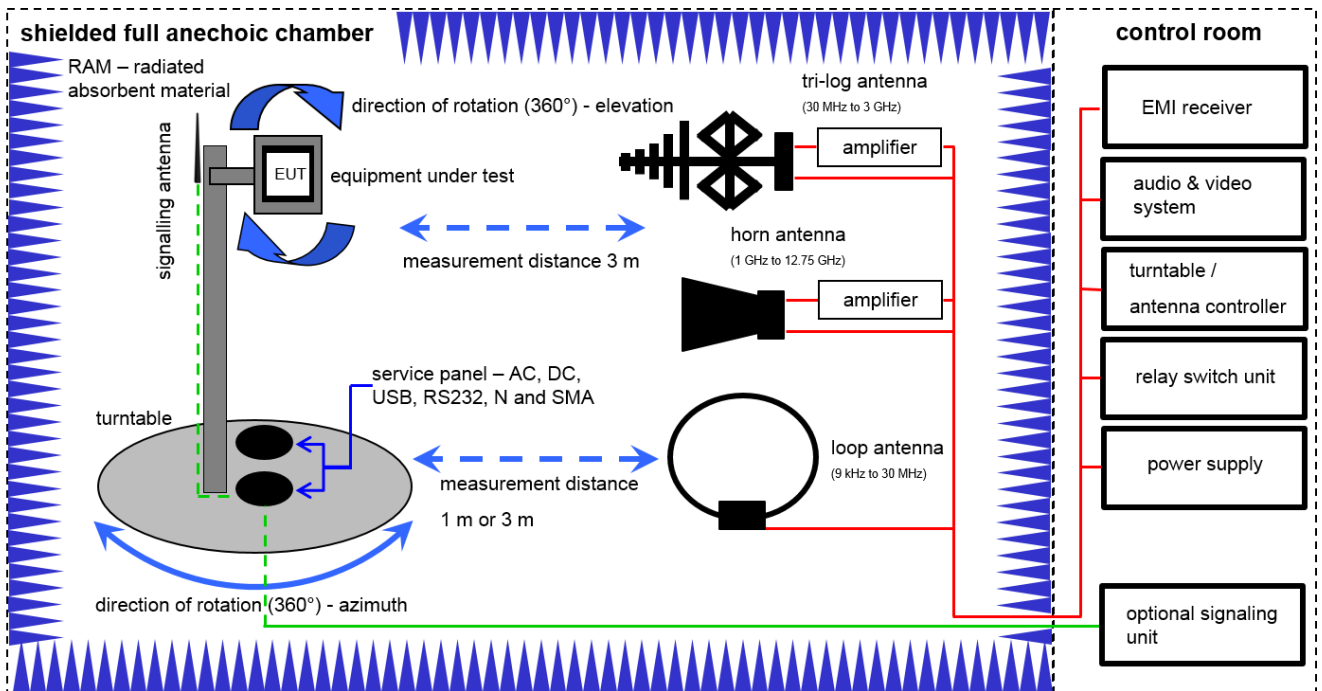
Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

### **Agenda:** Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
v/k!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

## 7.1 Radiated measurements chamber C



$$OP = AV + D - G + CA$$

(OP-output power; AV-analyzer value; D-distance; G-antenna gain+amplifier gain; CA-loss signal path)

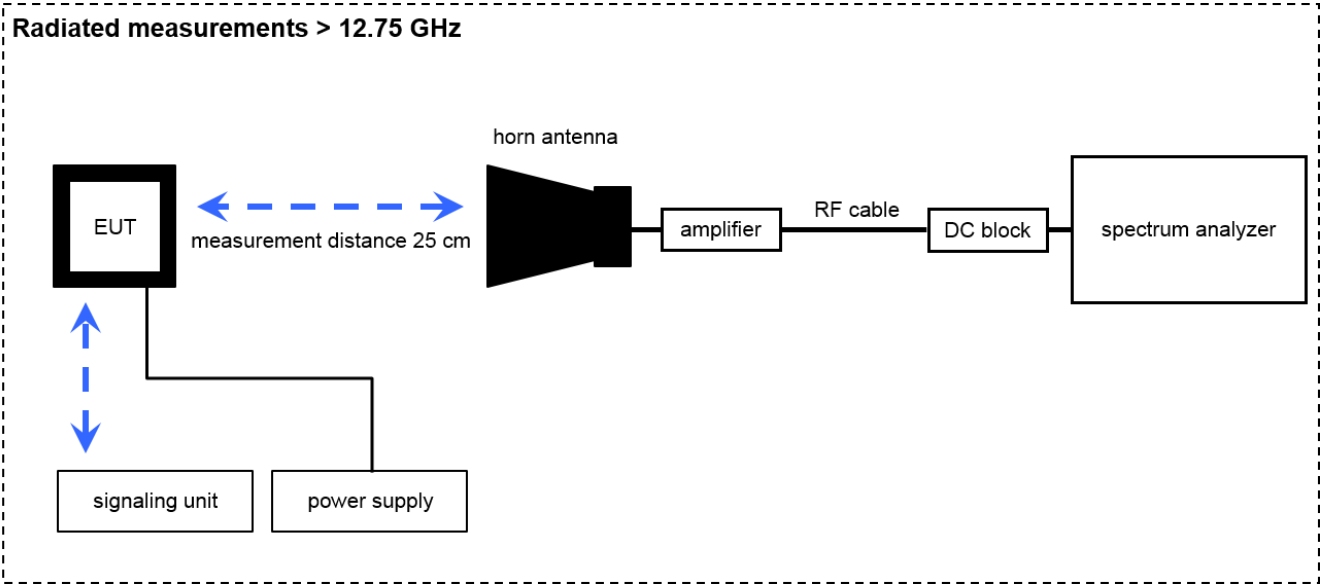
Example calculation:

$$OP [dBm] = -11.0 [dBm] + 47 [dB] - 8 [dB] + 5 [dB] = 33 [dBm] (2 W)$$

**Equipment table:**

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP	2818A03450	300001040	Ve	20.01.2015	20.01.2018
2	A	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vKI!	08.05.2013	08.05.2015
3	A	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev	-/-	-/-
4	A	Switch / Control Unit	3488A	HP	*	300000199	ne	-/-	-/-
5	A	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
6	A	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne	-/-	-/-
7	A	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne	-/-	-/-
8	A	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vKI!	29.10.2014	29.10.2017
9	A	MXE EMI Receiver 20 Hz to 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	06.03.2015	06.03.2016
10	A	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne	-/-	-/-
11	A	Wideband Radio Communication Tester	CMW500	R&S	102375	300004187	vKI!	28.01.2015	28.01.2017

**7.2 Radiated measurements > 12.75 GHz**



OP = AV + D - G + CA  
 (OP-output power; AV-analyzer value; D-distance; G-antenna gain+amplifier gain; CA-loss signal path)

Example calculation:

OP [dBm] = -41.0 [dBm] + 26 [dB] - 20 [dB] + 5 [dB] = -30 [dBm] (1 μW)

**Equipment table:**

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP	00419	300002268	ev	-/-	-/-
2	A	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000786	ne	-/-	-/-
3	A	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8402	300000486	ne	-/-	-/-
4	A	Spectrum Analyzer 9kHz to 30GHz - 140...+30dBm	FSP30	R&S	100886	300003575	k	26.08.2014	26.08.2016
5	A	Wideband Radio Communication Tester	CMW500	R&S	102375	300004187	vKI!	28.01.2015	28.01.2017



**8 Measurement uncertainty**

Measurement uncertainty	
Test case	Uncertainty
RF output power	±3 dB
Spurious emissions radiated below 30 MHz	± 3 dB
Spurious emissions radiated 30 MHz to 1 GHz	± 3 dB
Spurious emissions radiated 1 GHz to 12.75 GHz	± 3.7 dB
Spurious emissions radiated above 12.75 GHz	± 4.5 dB

## 9 Sequence of testing

### 9.1 Sequence of testing 9 kHz to 30 MHz

#### Setup

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.5 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

#### Final measurement

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with RMS (RMS / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

## 9.2 Sequence of testing 30 MHz to 1 GHz

### Setup

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 10 or 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.
- 

### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions
- 

### Final measurement

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^\circ$ ) and antenna movement between 1 and 4 meter.
- The final measurement will be done with RMS (RMS / see ANSI C 63.4) detector with an EMI receiver
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

### 9.3 Sequence of testing 1 GHz to 12.75 GHz

#### Setup

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter (see ANSI C 63.4) – see each test details
- The EUT was set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions

#### Final measurement

- The final measurement will be performed with minimum the six highest peaks according the requirements of the ANSI C63.4.
- According to the maximum found antenna polarization and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0° to 360°). This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps). This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS (RMS / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

## 9.4 Sequence of testing above 12.75 GHz

### Setup

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 0.5 meter
- The EUT was set into operation.

### Premeasurement

- The antenna is moved spherical over the EUT in different polarizations of the antenna.

### Final measurement

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and RMS (RMS / see ANSI C 63.4) detector
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

## 10 Summary of measurement results

<input type="checkbox"/>	No deviations from the technical specifications were ascertained
<input type="checkbox"/>	There were deviations from the technical specifications ascertained
<input checked="" type="checkbox"/>	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC identifier	Description	verdict	date	Remark
RF-Testing	CFR Part 27 RSS-130, RSS 139	See table	2015-08-03	Reference Document: Test report No. 1-9521_15-01-04-A

### 10.1 LTE – Band 4

Test Case	temperature conditions	power source voltages	C	NC	NA	NP	Remark
RF Output Power	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
Frequency Stability	Extreme	Extreme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Spurious Emissions Radiated	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
Spurious Emissions Conducted	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Block Edge Compliance	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Occupied Bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only

**Note:** C = compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

### 10.2 LTE – Band 13

Test Case	temperature conditions	power source voltages	C	NC	NA	NP	Remark
RF Output Power	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
Frequency Stability	Extreme	Extreme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Spurious Emissions Radiated	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
Spurious Emissions Conducted	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Block Edge Compliance	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only
Occupied Bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	radiated tests only

**Note:** C = compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

**11 RF measurements**

**11.1 LTE technologies supported by EUT**

Channel bandwidth

	Band 4	Band 13
[MHz]		
1.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## 11.2 Results LTE – Band 4

The EUT was set to transmit the maximum power.

### 11.2.1 RF output power

**Description:**

This paragraph contains EIRP measurements for the mobile station.

**Measurement:**

The mobile was set up for the maximum output power with pseudo random data modulation.

Measurement parameters	
Detector:	CMW500
Sweep time:	
Video bandwidth:	
Resolution bandwidth:	
Span:	
Trace-Mode:	
Used equipment:	see chapter 7.1 - A
Measurement uncertainty:	see chapter 8

**Limits:**

FCC	IC
Average E.I.R.P. Output Power	
+30.00 dBm	



**Results:**

The output power is measured with configuration of maximum conducted output power.

Output Power (radiated)			
Bandwidth (MHz)	Frequency (MHz)	Average Output Power (dBm)	
		QPSK	16-QAM
1.4	1710.7	19.67	18.57
	1732.5	23.19	22.29
	1754.3	22.18	21.08
3	1711.5	19.67	18.77
	1732.5	23.09	21.99
	1753.5	22.18	21.18
5	1712.5	19.77	18.77
	1732.5	22.99	21.99
	1752.5	22.18	21.18
10	1715.0	19.47	18.47
	1732.5	23.09	22.19
	1750.0	21.78	20.78
15	1717.5	19.37	18.60
	1732.5	23.09	22.09
	1747.5	21.78	20.68
20	1720.0	19.47	18.57
	1732.5	22.99	21.99
	1745.0	21.98	20.68

**Verdict:** [compliant](#)

## 11.2.2 Spurious emissions radiated

### Description:

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4:2009 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1755 MHz. Measurement made up to 26 GHz. The resolution bandwidth is set as outlined in Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE band 4.

### Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	2 sec.
Video bandwidth:	1 MHz
Resolution bandwidth:	1 MHz
Span:	100 MHz Steps
Trace-Mode:	Max Hold
Used equipment:	see chapter 7.1 - A & 7.2 - A
Measurement uncertainty:	see chapter 8

### Limits:

FCC	IC
Spurious Emissions Radiated	
Attenuation $\geq 43 + 10\log(P)$ (P, Power in Watts)	
-13 dBm	

**Results:**

Radiated emissions measurements were made only at the center frequency of the LTE band 4 (1732.5 MHz). It was decided that measurements at this carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE band 4 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

The final open field radiated levels are presented on the next pages.

All measurements were done in horizontal and vertical polarization; the plots show the worst case.

The plots show only the middle channel with 10 MHz bandwidth and full resource blocks. If spurious were detected, the lowest and highest channel and other supported channel bandwidths were checked, too.

As can be seen from this data, the emissions from the test item were within the specification limit.

**QPSK**

SPURIOUS EMISSION LEVEL (dBm)	
MIDDLE CHANNEL	
Spurious emissions	Level [dBm]
3465.0	-
5197.5	-
6930.0	-
8662.5	-
10395.0	-
12127.5	-
13860.0	-
15592.5	-
17325.0	-

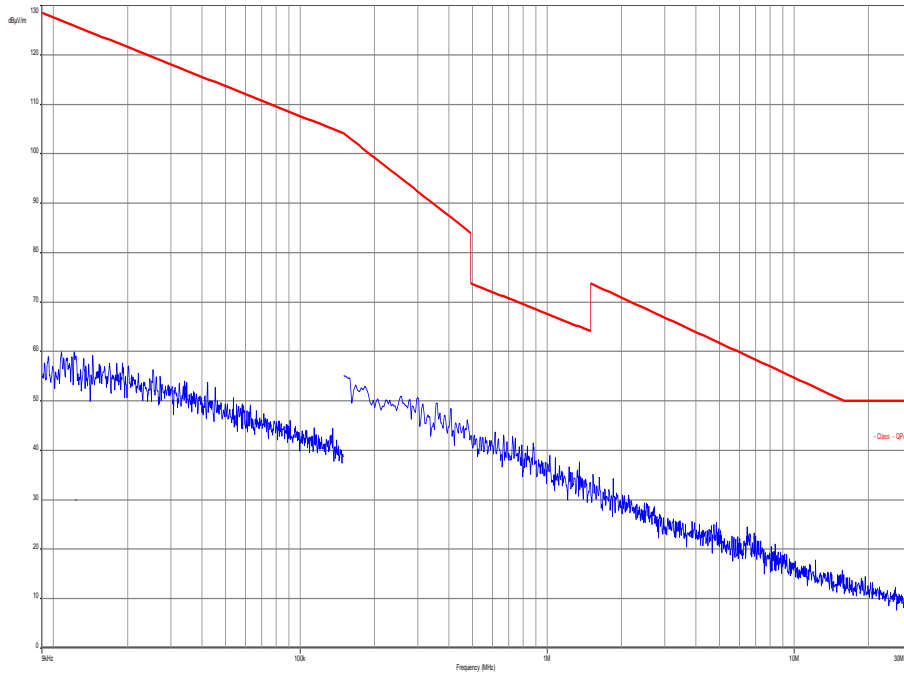
**16-QAM**

SPURIOUS EMISSION LEVEL (dBm)	
MIDDLE CHANNEL	
Spurious emissions	Level [dBm]
3465.0	-
5197.5	-
6930.0	-
8662.5	-
10395.0	-
12127.5	-
13860.0	-
15592.5	-
17325.0	-

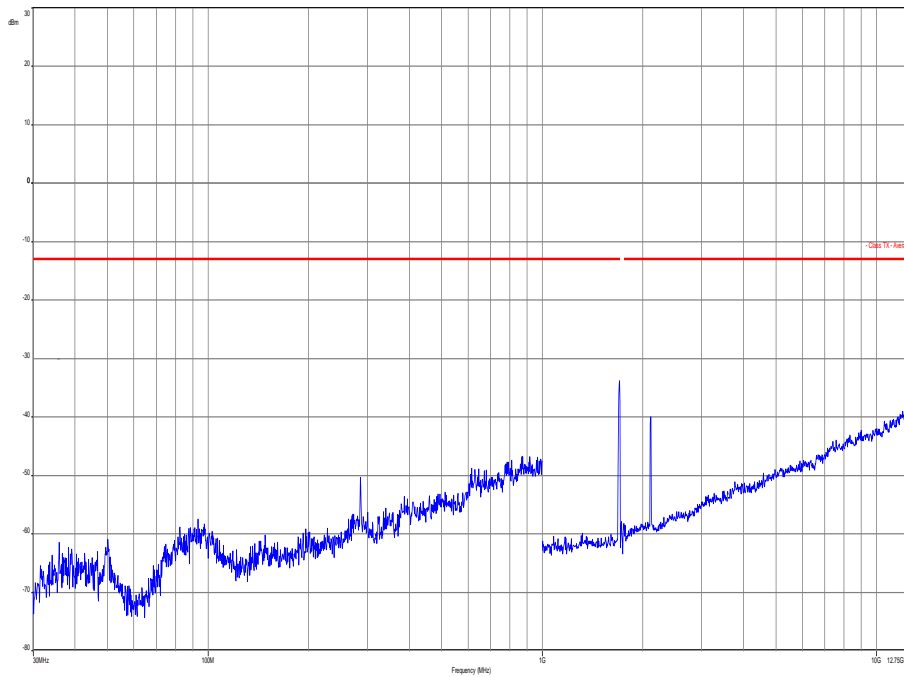
**Verdict: [compliant](#)**

**QPSK with 10 MHz channel bandwidth**

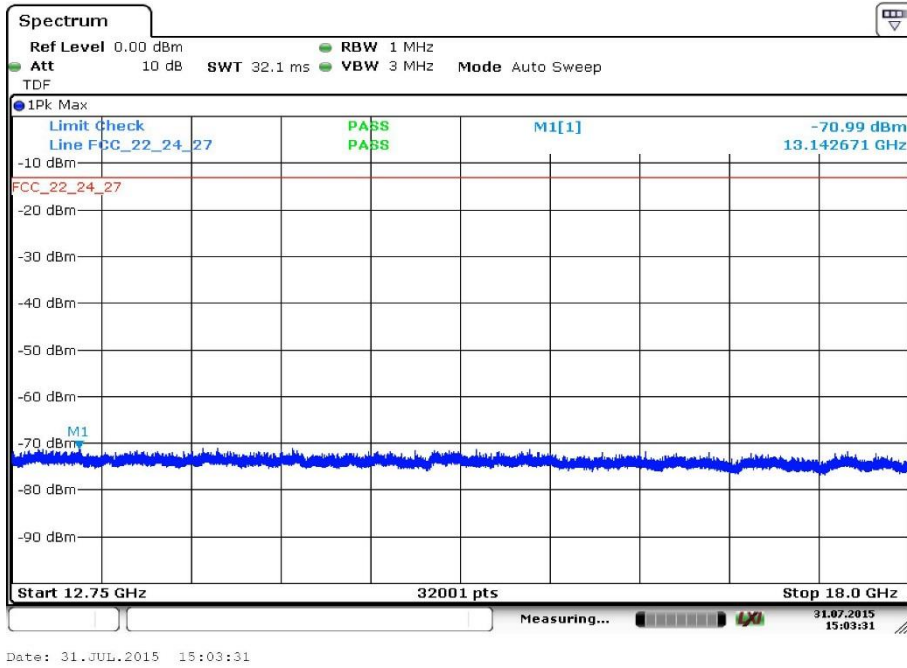
**Plot 1: Middle channel, up to 30 MHz**



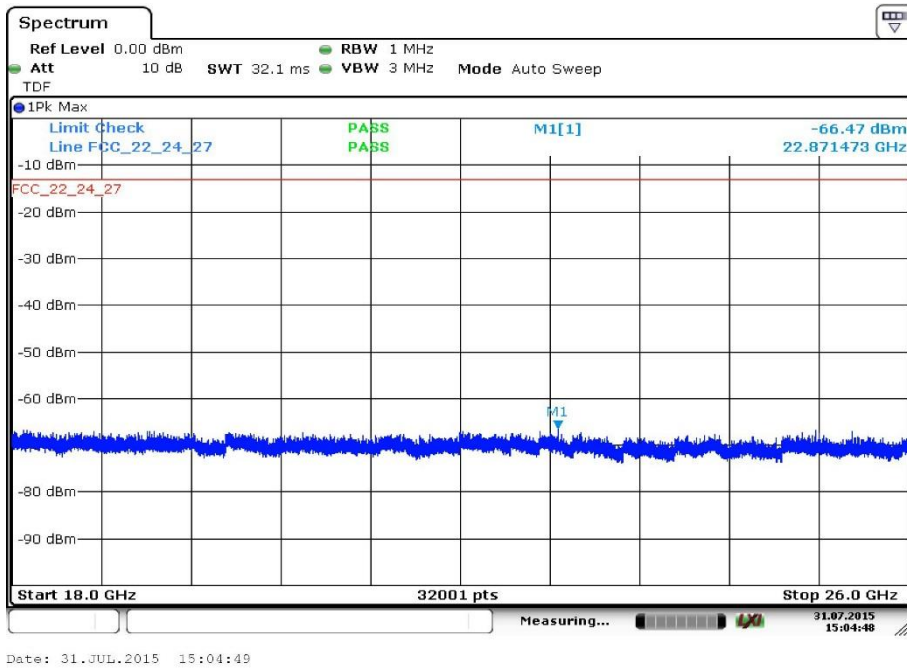
**Plot 2: Middle channel, 30 MHz to 12.75 GHz**



Plot 3: Middle channel, 12.75 GHz to 18 GHz

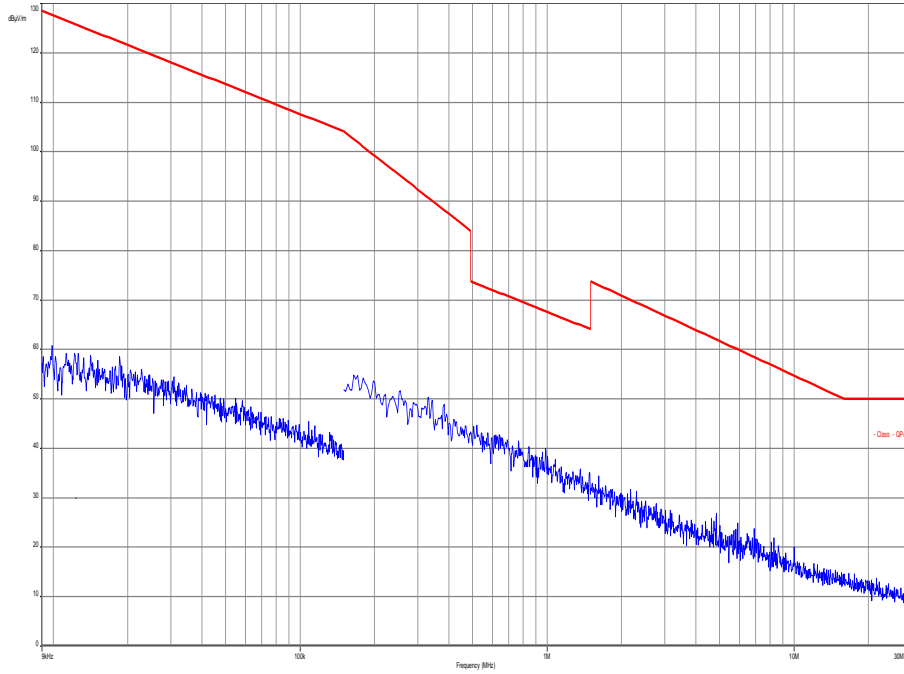


Plot 4: Middle channel, 18 GHz to 26 GHz

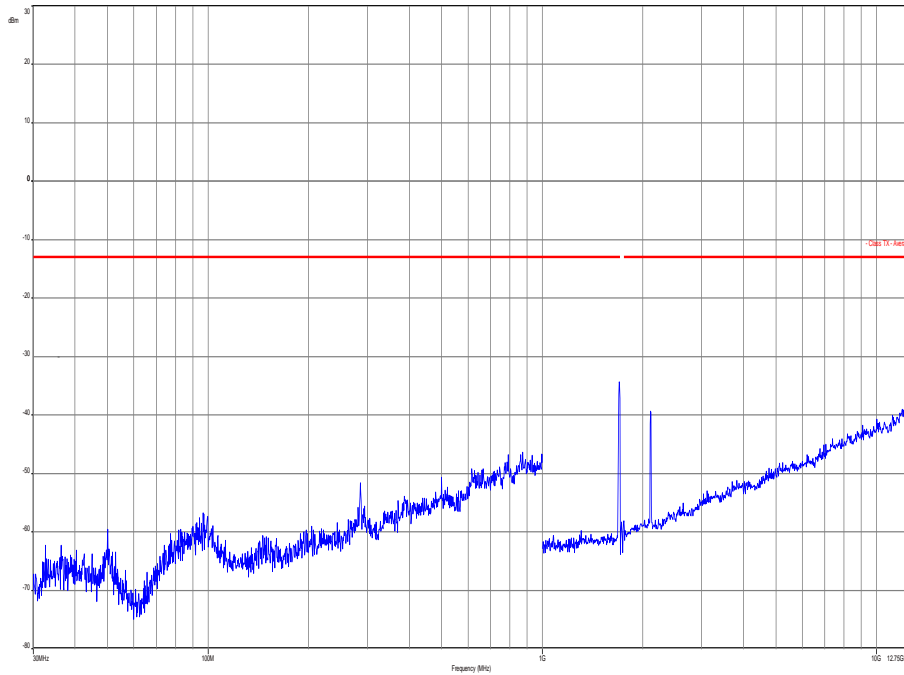


**16-QAM with 10 MHz channel bandwidth**

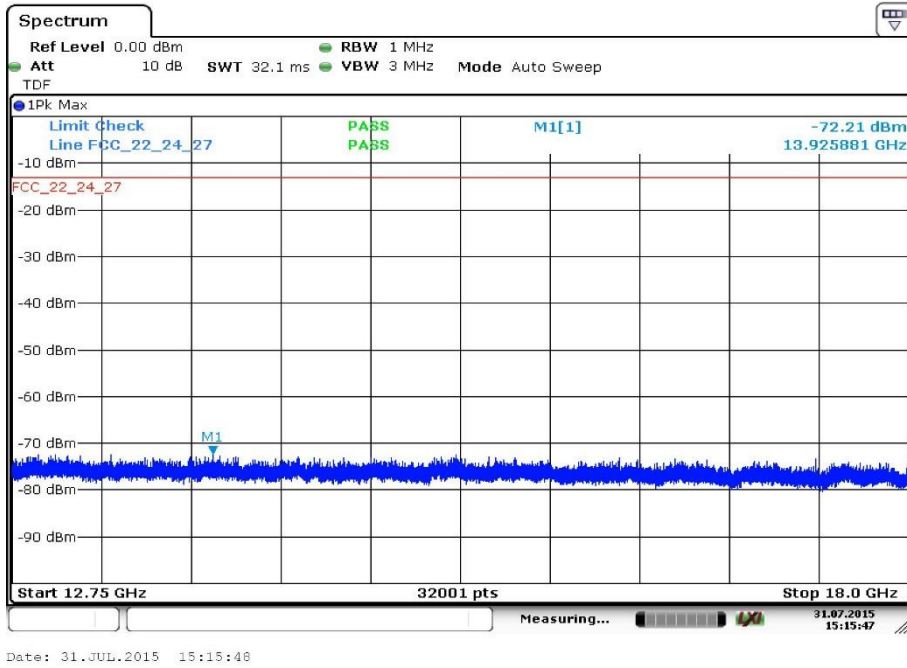
**Plot 5: Middle channel, up to 30 MHz**



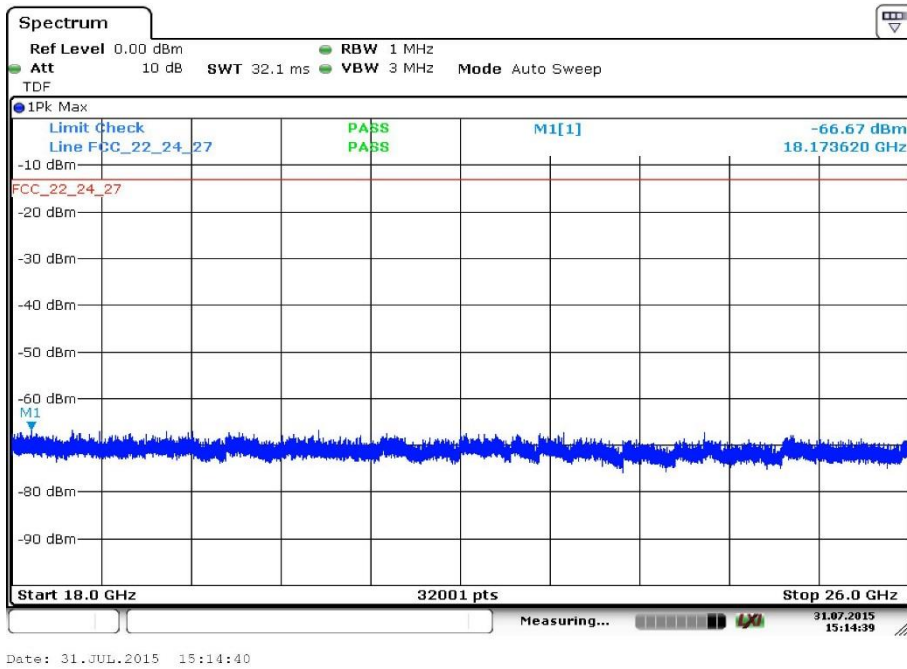
**Plot 6: Middle channel, 30 MHz to 12.75 GHz**



Plot 7: Middle channel, 12 GHz to 18 GHz



Plot 8: Middle channel, 18 GHz to 26 GHz





### 11.3 Results LTE – Band 13

The EUT was set to transmit the maximum power.

#### 11.3.1 RF output power

**Description:**

This paragraph contains average power, peak output power and EIRP measurements for the mobile station.

**Measurement:**

The mobile was set up for the maximum output power with pseudo random data modulation.

Measurement parameters	
Detector:	CMW500
Sweep time:	
Video bandwidth:	
Resolution bandwidth:	
Span:	
Trace-Mode:	
Used equipment:	See chapter 7.1 - A
Measurement uncertainty:	see chapter 8

**Limits:**

FCC	IC
Nominal Peak Output Power	
+33.00 dBm	

**Results:**

The output power is measured with full resource blocks.

Output Power (radiated)			
Bandwidth (MHz)	Frequency (MHz)	Average Output Power (dBm) QPSK	Average Output Power (dBm) 16-QAM
5	779.5	9.41	8.31
	782.0	12.60	11.30
	784.5	15.95	14.68
10	782.0	12.40	11.00

**Verdict:** [compliant](#)

### 11.3.2 Spurious emissions radiated

#### Description:

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 9 kHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 784.5 MHz. Measured up to 12.75 GHz. The resolution bandwidth is set as outlined in Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE band 13.

#### Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	2 s
Video bandwidth:	1 MHz
Resolution bandwidth:	1 MHz
Span:	100 MHz Steps
Trace-Mode:	Max Hold
Used equipment:	see chapter 7.1 - A
Measurement uncertainty:	see chapter 8

#### Limits:

FCC	IC
Spurious Emissions Radiated	
Attenuation $\geq 43 + 10\log(P)$ (P, Power in Watts)	
-13 dBm	

**Results:**

Radiated emissions measurements were made only at the center frequency of the LTE band 13 (782.0 MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE band 13 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

The final open field radiated levels are presented on the next pages.

All measurements were done in horizontal and vertical polarization; the plots show the worst case.

The plots show only the middle channel 10 MHz bandwidth and full resource blocks. If spurious were detected, the lowest and highest channel and all supported channel bandwidths were checked, too.

As can be seen from this data, the emissions from the test item were within the specification limit.

**QPSK**

SPURIOUS EMISSION LEVEL (dBm)	
MIDDLE CHANNEL	
Spurious emissions	Level [dBm]
1564.0	-
2346.0	-
3128.0	-
3910.0	-
4692.0	-
5474.0	-
6256.0	-
7038.0	-
7820.0	-

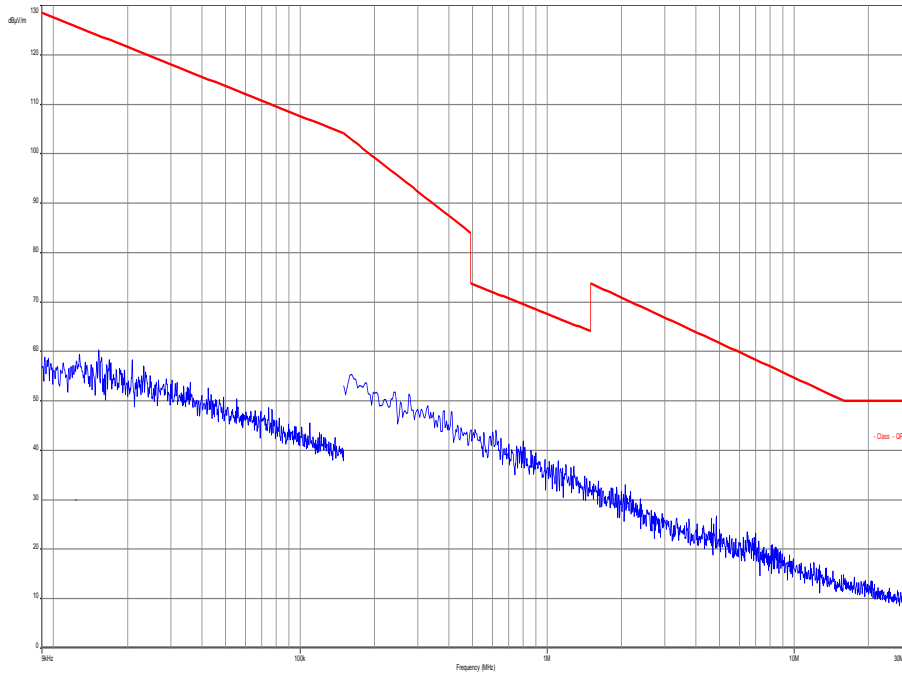
**16-QAM**

SPURIOUS EMISSION LEVEL (dBm)	
MIDDLE CHANNEL	
Spurious emissions	Level [dBm]
1564.0	-
2346.0	-
3128.0	-
3910.0	-
4692.0	-
5474.0	-
6256.0	-
7038.0	-
7820.0	-

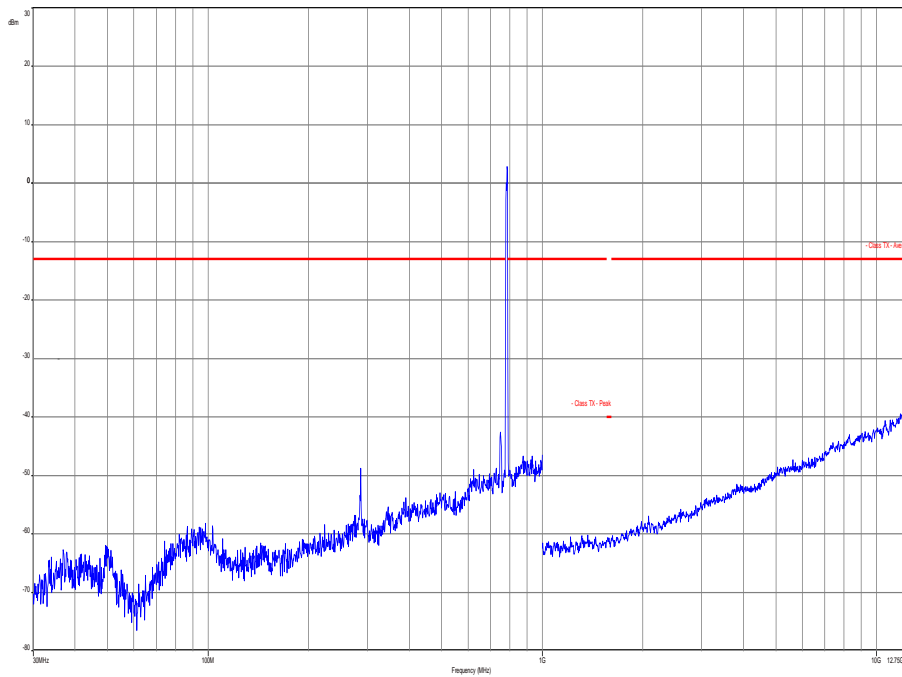
**Verdict: [compliant](#)**

**QPSK with 10 MHz channel bandwidth**

**Plot 1: Middle channel, up to 30 MHz**

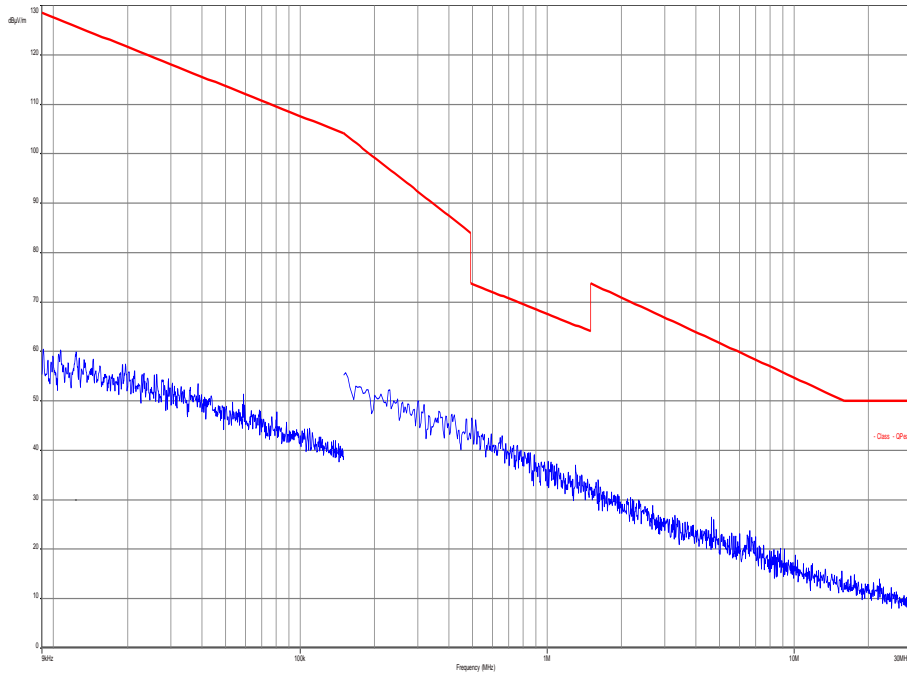


**Plot 2: Middle channel, 30 MHz to 12.75 GHz**

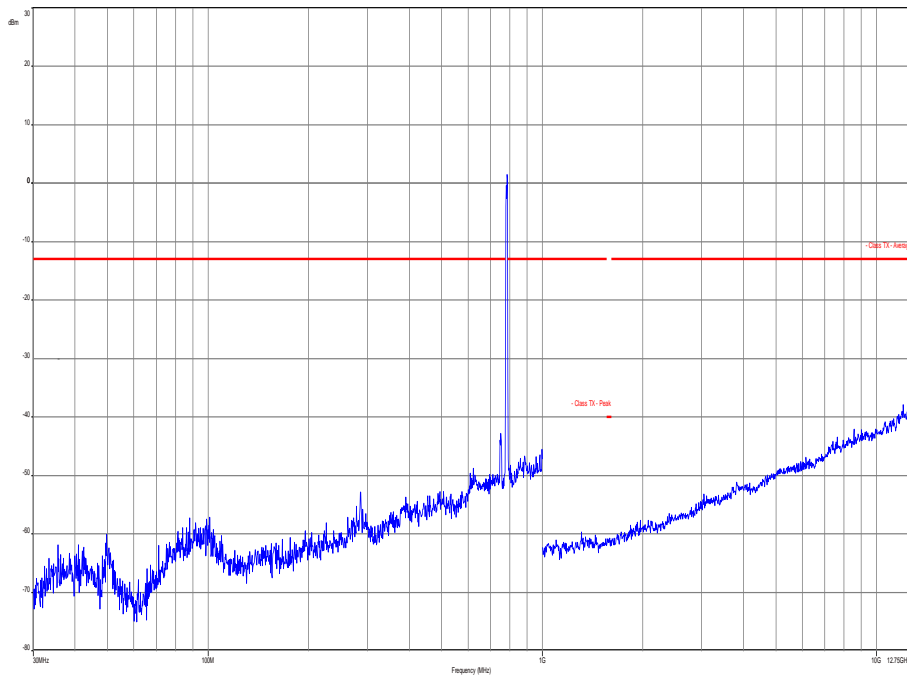


**16-QAM with 10 MHz channel bandwidth**

**Plot 3: Middle channel, up to 30 MHz**



**Plot 4: Middle channel, 30 MHz to 12.75 GHz**



## 12 Observations

No observations except those reported with the single test cases have been made.

## Annex A Document history

Version	Applied changes	Date of release
	Initial release	2015-06-26
A	Editorial changes	2015-08-03

## Annex B Further information

### Glossary

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software



## Annex C Accreditation Certificate

Front side of certificate

Back side of certificate



Deutsche Akkreditierungsstelle GmbH

Bellehene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV  
 Unterzeichnerin der Multilateralen Abkommen  
 von EA, ILAC und IAF zur gegenseitigen Anerkennung

**Akkreditierung**



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

**CETECOM ICT Services GmbH**  
 Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

- Drahtgebundene Kommunikation einschließlich xDSL
- VoIP und DECT
- Akustik
- Funk einschließlich WLAN
- Short Range Devices (SRD)
- RFID
- WiFiMax und Richtfunk
- Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
- Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
- Produktsicherheit
- SAR und Hearing Aid Compatibility (HAC)
- Umweltsimulation
- Smart Card Terminals
- Bluetooth
- Wi-Fi Services

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 07.03.2014 mit der Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 77 Seiten.

Registrierungsnummer der Urkunde: D-PL-12076-01-00

Frankfurt am Main, 07.03.2014

Stelle des Akkreditierungsausschusses

Dr. Ingrid Othmar, stellv. Vorsitzende  
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 60594 Frankfurt am Main

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 38115 Braunschweig

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Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abt. L 218 vom 9. Juli 2008, S. 30). Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen erkennen ihre Akkreditierungen gegenseitig an.

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 IAF: [www.iaf.or.jp](http://www.iaf.or.jp)  
 ILAC: [www.ilac.or.jp](http://www.ilac.or.jp)

**Note:**

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>